

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION**

**ORDER NO. 97-011**

**SITE CLEANUP REQUIREMENTS FOR:**

**LOCKHEED MARTIN CORPORATION, MISSILES & SPACE AND  
SOBRATO DEVELOPMENT COMPANIES**

for the property located at

**1235 ELKO DRIVE  
SUNNYVALE  
SANTA CLARA COUNTY**

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter Board), finds that:

1. **Site Location:** The site is located in the northern portion of the City of Sunnyvale, Santa Clara County, California. It is situated on the north side of Elko Drive, approximately 1-1/4 miles north of Interstate Highway 101 and approximately 1/4 mile south of Highway 237. The site and the surrounding area are relatively flat, lying at an elevation of between 5 and 8 feet above mean sea level.
2. **Site History:** Sobrato Development Companies (Sobrato) owns the property located at 1235 Elko Drive. The property was developed in 1967, and Lockheed Missiles & Space Company, Inc. (now Lockheed Martin Corporation, Missiles and Space (LMMS)) used the property from 1968 until 1992, first as a machine shop and later as a product development shop. Both the machine shop and the product development used similar equipment and chemicals. The lease for Building 521 was terminated in August 1992.

The manufacturing activities at the building included grinding, shearing, cutting, and other machine shop operations. The northwest corner of the building was used as a welding area until 1975. There were six shallow machine sumps in the building. The sumps were not used as primary containment for hazardous materials. Most of the liquid hazardous materials used at the site were stored in small quantities of less than five gallons and stored in chemical cabinets. Larger quantities of liquid chemicals were stored in 55-gallon drums which were located in a concrete bermed storage facility on the west side of the building. The volatile organic compounds (VOCs)

used at the site were mainly Freon-113, methyl ethyl ketone (MEK), TCE, and isopropyl alcohol (IPA).

3. **Named Dischargers:** LMMS is named as a discharger based on its past chemical use and activities during its occupancy of the site from 1968 to 1992, and based on soil and groundwater contamination patterns.

Sobrato is named as discharger because it is current owner of the site and will be responsible for compliance only if the Board or Executive Officer find that other named dischargers have failed to comply with the requirements of this order.

If additional information is submitted indicating that other parties caused or permitted any waste to be discharged on the site where it entered or could have entered waters of the state, the Board will consider adding that party's name to this order.

4. **Regulatory Status:** This site is currently not subject to Board order.
5. **Site Hydrogeology:** Surface water bodies in the vicinity of the site consist of San Francisco Bay, tidal creeks and estuarine wetlands adjacent to the bay that flow from ephemeral freshwater streams from the Santa Cruz mountains to San Francisco Bay. Surface runoff in the site vicinity is controlled by urban storm-water runoff systems that eventually lead to the City of Sunnyvale storm drain system.

The shallow subsurface deposits in the area are fine grained estuarine deposits consisting of unconsolidated, plastic clays and silty clay, which are rich in organic material that contains lenses and stringers of well sorted silt and sand, as well as beds of peat.

Groundwater generally exists in the permeable sand and gravel and alluvial fans deposited by east-flowing streams descending from the Santa Cruz Mountains. The regional groundwater gradient, as determined by other studies in the immediate area of the site, is northerly. The studies determined that a shallow water-bearing zone ("A" zone) was encountered at a depth of approximately 8-1/2 feet below ground surface (bgs), and an intermediate water-bearing zone ("B" zone) exists from about 42 to about 75 feet bgs.

6. **Remedial Investigation:** Sobrato and LMMS performed soil and groundwater investigations at the site in the early 1990s. Sobrato conducted soil investigation in the vicinity of the former hazardous materials storage area in November 1990. Soil samples from five soil borings were analyzed for VOCs using EPA Method 8010. Analytical results indicated the presence of low levels of TCE, 1,2-DCE and Freon-113.

Additional soil investigation was conducted by LMMS in August 1992, as part of

closure activities for the building. Soil samples collected from the potential source areas including the hazardous materials and hazardous waste storage areas, near sumps and adjacent to machine locations. Soil samples beneath the two sumps and associated piping in the northwest corner of the building indicated elevated levels of TCE and trans-1,2-DCE. Where practical, all contaminated soils containing VOCs above cleanup levels were excavated in 1992.

**Groundwater:** Sobrato conducted groundwater investigation at the site in 1990. Groundwater samples were analyzed for VOCs using EPA Method 8240. Results of these analyses indicated that PCE and TCE were detected above drinking water standards. Other VOCs such as 1,1-DCE, 1,2-DCE, chloroform, methylene chloride, Freon-113, and toluene were also detected. LMMS also performed groundwater investigation in 1992 and 1993. Water samples were collected within the excavated area and analyzed for VOCs by EPA Method 8240. Analytical results indicated elevated concentrations of TCE and 1,2-DCE at and near the former sumps at the northwest corner of the site.

LMMS conducted additional groundwater investigation to delineate the lateral extent of VOCs at the site in 1993 and 1994. LMMS installed two additional monitoring wells, two extraction wells, and four piezometers at the site. Groundwater data indicated presence of elevated concentrations of TCE up to 1900 ppb and cis-1,2-DCE up to 160 ppb along the northern boundary of the property. Given the limited presence of VOCs in soil and groundwater at the site and due to existing data generated for nearby sites, determination of the vertical extent of VOCs is not needed for the site. However, LMMS needs to address off-site migration of VOCs that occurred prior to the start-up of the IRM system.

#### **7. Interim Remedial Measures:**

**Soil Excavation:** LMMS conducted appropriate source control activities in 1992. These activities include identification and removal of soils containing VOCs above preliminary cleanup goals (1 parts per million (ppm)), where practical, in the northwest corner of the building. The excavated area encompassed the floor drains, piping and sumps, the apparent sources of the soil contamination. A contaminated area of about 600 square feet was excavated to a depth of 14 feet. The excavation avoided the building foundation to protect the structural integrity of the building. LMMS also properly swept, rinsed and filled in with concrete to floor level all of the sumps. Confirmation soil samples were collected on August 11 and 12, 1992 from the soil left in place adjacent to the excavation. Based on the confirmatory soil samples, no additional soil remediation is needed for the site.

**Groundwater IRM:** LMMS implemented groundwater interim remedial measures (IRMs) at the site in 1994. The IRMs consist of two shallow groundwater extraction wells, which discharge extracted groundwater directly to the City's sanitary sewer.

There are four monitoring wells and four piezometers at the site. The system has extracted about 2 pounds of VOCs since it began operation.

The system has been effective in reducing VOC concentrations on-site. An evaluation of the IRMs is needed to demonstrate the IRMs' ability to reduce the threat to water quality, public health, and the environment posed by the discharge of waste and to provide a technical basis for selecting and designing final remedial measures.

8. **Adjacent Sites:**

**Former Western Microwave, Inc. (WMI) Facility:** This site is located at 1271 Reamwood Avenue, downgradient and north of the LMMS site. WMI discovered a VOC release at its site in 1985. The indicator chemicals are PCE and its breakdown products (TCE and cis- and trans-1,2-DCE), dichlorobenzenes, ethylbenzene and xylenes. VOC concentration were substantially higher both in soil and in groundwater at the WMI site than at the LMMS site. In 1995-1996, WMI conducted extensive source removal and implemented a groundwater extraction and treatment system. The Board adopted initial site cleanup requirements for the WMI site in May 1993, and amended them in July 1995. Since the LMMS site is upgradient of the WMI site, pollutants from the LMMS site have likely migrated off-site and may have commingled with the WMI's VOC plume, particularly at the southern portion of the WMI site.

**Former Intersil Facility:** This site is located at 1276 Hammerwood Avenue, Sunnyvale, downgradient and northwest of LMMS. VOC releases were first discovered at this site in 1982. Subsurface investigations at the Intersil site revealed the presence of chlorinated organic solvents in the soil and groundwater. TCE, DCE and other breakdown products and Freon-113 are the indicator chemicals at this site. The Board adopted Waste Discharge requirements for the Intersil site in October 1986, and revised final site cleanup requirements was adopted in November 1993. Intersil operated a groundwater extraction and treatment system from 1987 to 1995. Intersil switched to a passive remediation system in 1995. Due to the proximity of the two sites, VOCs that originated at the LMMS site may have migrated to the Intersil site, prior to curtailment of Intersil's groundwater extraction system.

Data collected during quarterly monitoring events at the LMMS site have revealed very low VOC concentrations in groundwater at the southern boundary, upgradient of the site. The source is presently not known.

9. **Basin Plan:** The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21, 1995. This updated and consolidated plan represents the Board's master water quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board and the Office of Administrative Law on July 20, 1995, and November 13, 1995,

respectively. A summary of regulatory provisions is contained in 23 CCR 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the State, including surface waters and groundwaters.

The potential beneficial uses of groundwater underlying and adjacent to the site include:

- a. Municipal and domestic water supply
- b. Industrial process water supply
- c. Industrial service water supply
- d. Agricultural water supply

At present, there is no known use of groundwater underlying the site for the above purposes.

10. **Other Board Policies:** Board Resolution No. 88-160 allows discharges of extracted, treated groundwater from site cleanups to surface waters only if it has been demonstrated that neither reclamation nor discharge to the sanitary sewer is technically and economically feasible.

Board Resolution No. 89-39, "Sources of Drinking Water," defines potential sources of drinking water to include all groundwater in the region, with limited exceptions for areas of high TDS, low yield, or naturally-high contaminant levels.

11. **State Water Board Policies:** State Water Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," applies to this discharge and requires attainment of background levels of water quality, or the highest level of water quality which is reasonable if background levels of water quality cannot be restored. Cleanup levels other than background must be consistent with the maximum benefit to the people of the State, not unreasonably affect present and anticipated beneficial uses of such water, and not result in exceedance of applicable water quality objectives.

State Water Board Resolution No. 92-49, "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304," applies to this discharge. This order and its requirements are consistent with the provisions of Resolution No. 92-49, as amended.

12. **Preliminary Cleanup Goals:** The dischargers will need to make assumptions about future cleanup standards for soil and groundwater, in order to determine the necessary extent of remedial investigation, interim remedial actions, and the draft cleanup plan. Pending the establishment of site-specific cleanup standards, the following preliminary cleanup goals should be used for these purposes:

- a. **Groundwater:** Applicable water quality objectives (e.g. maximum contaminant levels, or MCLs) or, in the absence of a chemical-specific objective, risk-based levels (e.g. drinking water equivalent levels).
  - b. **Soil:** 1 mg/kg total volatile organic compounds (VOCs), 10 mg/kg total semi-volatile organic compounds (SVOCs), and background concentrations of metals.
13. **Basis for 13304 Order:** The dischargers have caused or permitted waste to be discharged or deposited where it is or probably will be discharged into waters of the State and creates or threatens to create a condition of pollution or nuisance.
14. **Cost Recovery:** Pursuant to California Water Code Section 13304, the dischargers are hereby notified that the Board is entitled to, and may seek reimbursement for, all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this order.
15. **CEQA:** This action is an order to enforce the laws and regulations administered by the Board. As such, this action is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to Section 15321 of the Resources Agency Guidelines.
16. **Notification:** The Board has notified the dischargers and all interested agencies and persons of its intent under California Water Code Section 13304 to prescribe site cleanup requirements for the discharge, and has provided them with an opportunity to submit their written comments.
17. **Public Hearing:** The Board, at a public meeting, heard and considered all comments pertaining to this discharge.

**IT IS HEREBY ORDERED**, pursuant to Section 13304 of the California Water Code, that the dischargers (or their agents, successors, or assigns) shall cleanup and abate the effects described in the above findings as follows:

**A. PROHIBITIONS**

1. The discharge of wastes or hazardous substances in a manner which will degrade water quality or adversely affect beneficial uses of waters of the State is prohibited.
2. Further significant migration of wastes or hazardous substances through

subsurface transport to waters of the State is prohibited.

3. Activities associated with the subsurface investigation and cleanup which will cause significant adverse migration of wastes or hazardous substances are prohibited.

## **B. TASKS**

1. **PROPOSED FINAL REMEDIAL ACTIONS AND CLEANUP STANDARDS**

**COMPLIANCE DATE:** May 31, 1997

Submit a technical report acceptable to the Executive Officer containing:

- a. Summary of remedial investigations results
- b. Evaluation of the installed interim remedial actions
- c. Feasibility study evaluating alternative final remedial actions
- d. Risk assessment for current and post-cleanup exposures
- e. Recommended final remedial actions and cleanup standards
- f. Implementation tasks and time schedule

Item c should include projections of cost, effectiveness, benefits, and impact on public health, welfare, and the environment of each alternative action.

Items a through c should be consistent with the guidance provided by Subpart F of the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300), CERCLA guidance documents with respect to remedial investigations and feasibility studies, Health and Safety Code Section 25356.1(c), and State Board Resolution No. 92-49 as amended ("Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304").

Items a through e should consider the preliminary cleanup goals for soil and groundwater identified in finding 12.

The remedial action plan must address affected off-site area beyond the property line. The dischargers are encouraged to coordinate cleanup plans with adjacent sites, in order to avoid conflicting or duplicative cleanup plans and to minimize cleanup costs.

2. **Delayed Compliance:** If the discharger is delayed, interrupted, or prevented from meeting one or more of the completion dates specified for the above tasks, the discharger shall promptly notify the Executive Officer and the Board may

consider revision to this Order.

### C. PROVISIONS

1. **No Nuisance:** The storage, handling, treatment, or disposal of polluted soil or groundwater shall not create a nuisance as defined in California Water Code Section 13050(m).
2. **Good Operation and Maintenance (O&M):** The dischargers shall maintain in good working order and operate as efficiently as possible any facility or control system installed to achieve compliance with the requirements of this Order.
3. **Cost Recovery:** The dischargers shall be liable, pursuant to California Water Code Section 13304, to the Board for all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this Order. If the site addressed by this Order is enrolled in a State Board-managed reimbursement program, reimbursement shall be made pursuant to this Order and according to the procedures established in that program. Any disputes raised by the dischargers over reimbursement amounts or methods used in that program shall be consistent with the dispute resolution procedures for that program.
4. **Access to Site and Records:** In accordance with California Water Code Section 13267(c), the dischargers shall permit the Board or its authorized representative:
  - a. Entry upon premises in which any pollution source exists, or may potentially exist, or in which any required records are kept, which are relevant to this Order.
  - b. Access to copy any records required to be kept under the requirements of this Order.
  - c. Inspection of any monitoring or remediation facilities installed in response to this Order.
  - d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the dischargers.



5. **Self-Monitoring Program:** The dischargers shall comply with the Self-Monitoring Program as attached to this Order and as may be amended by the Executive Officer.
6. **Contractor / Consultant Qualifications:** All technical documents shall be signed by and stamped with the seal of a California registered geologist, a California certified engineering geologist, or a California registered civil engineer.
7. **Lab Qualifications:** All samples shall be analyzed by State-certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control (QA/QC) records for Board review. This provision does not apply to analyses that can only reasonably be performed on-site (e.g. temperature).
8. **Document Distribution:** Copies of all correspondence, technical reports, and other documents pertaining to compliance with this Order shall be provided to the following agencies:
  - a. City of Sunnyvale, Fire Department
  - b. County of Santa Clara, Department of Environmental Health
  - c. Santa Clara Valley Water District

The Executive Officer may modify this distribution list as needed.
9. **Reporting of Changed Owner or Operator:** The dischargers shall file a technical report on any changes in site occupancy or ownership associated with the property described in this Order.
10. **Reporting of Hazardous Substance Release:** If any hazardous substance is discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State caused by LMMS and/or Sobrato, the responsible discharger shall report such discharge to the Regional Board by calling (510) 286-1255 during regular office hours (Monday through Friday, 8:00 to 5:00).

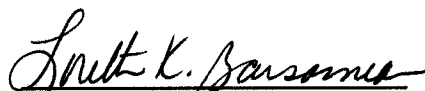
A written report shall be filed with the Board within five working days. The report shall describe: the nature of the hazardous substance, estimated quantity involved, duration of incident, cause of release, estimated size of affected area, nature of effect, corrective actions taken or planned, schedule of corrective actions planned, and persons/agencies notified.

This reporting is in addition to reporting to the Office of Emergency Services

required pursuant to the Health and Safety Code.

11. **Secondarily-Responsible Discharger:** Within 60 days after being notified by the Executive Officer that other named dischargers have failed to comply with this order, Sobrato as property owner shall then be responsible for complying with this order.
12. **Periodic SCR Review:** The Board will review this Order periodically and may revise it when necessary. The dischargers may request revisions and upon review the Executive Officer may recommend that the Board revise these requirements.

I, Loretta K. Barsamian, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on January 15, 1997.

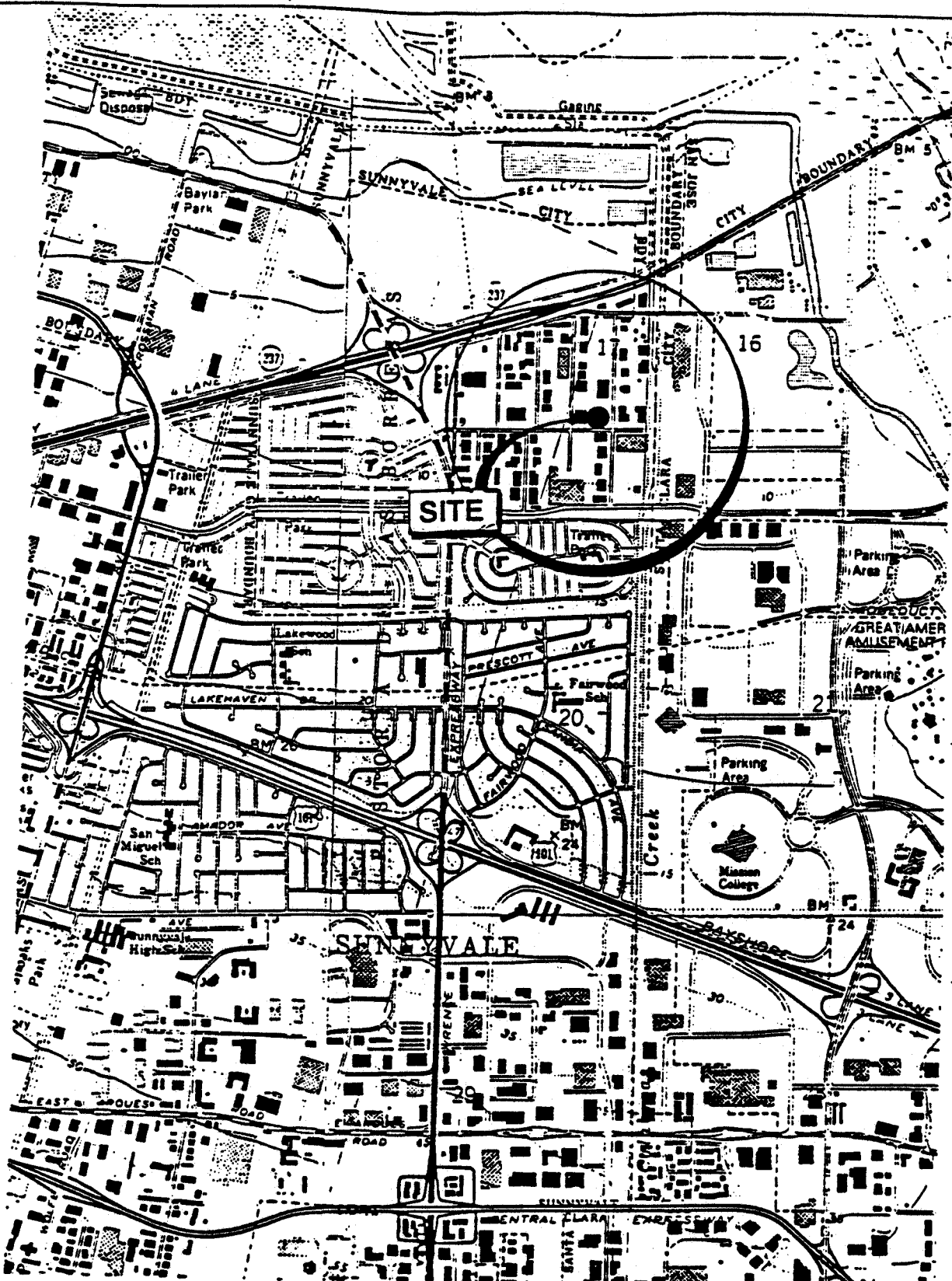
  
Loretta K. Barsamian  
Executive Officer

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FAILURE TO COMPLY WITH THE REQUIREMENTS OF THIS ORDER MAY  
SUBJECT YOU TO ENFORCEMENT ACTION, INCLUDING BUT NOT LIMITED TO:  
IMPOSITION OF ADMINISTRATIVE CIVIL LIABILITY UNDER WATER CODE  
SECTIONS 13268 OR 13350, OR REFERRAL TO THE ATTORNEY GENERAL FOR  
INJUNCTIVE RELIEF OR CIVIL OR CRIMINAL LIABILITY

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Attachments: Site Map  
Self-Monitoring Program



Map Source: USGS 7.5', Milpitas, Calif., 1961, Photorevised: 1980  
 USGS 7.5', Mountain View, Calif., 1961, Photorevised: 1981

0 2000  
 SCALE (FEET)



FIGURE 1  
 SITE LOCATION MAP  
 FORMER LMMS BUILDING 521 SITE  
 SUNNYVALE, CA

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION**

**SELF-MONITORING PROGRAM FOR:**

**LOCKHEED MARTIN CORPORATION, MISSILES & SPACE AND  
SOBRATO DEVELOPMENT COMPANIES**

for the property located at

**1235 ELKO DRIVE  
SUNNYVALE  
SANTA CLARA COUNTY**

1. **Authority and Purpose:** The Board requests the technical reports required in this Self-Monitoring Program pursuant to Water Code Sections 13267 and 13304. This Self-Monitoring Program is intended to document compliance with Board Order No. 97-011 (site cleanup requirements).
2. **Monitoring:** The discharger shall measure groundwater elevations quarterly in all monitoring wells, and shall collect and analyze representative samples of groundwater according to the following schedule:

Well #	Sampling Frequency	Analyses	Well #	Sampling Frequency	Analyses
521-1	A	8240	MW-1	SA	8010/8240
521-2	A	8240	PZ-1	A	8240
521-3	A	8240	PZ-2	Q	8010/8240
521-4*	Q	8010/8240	PZ-3	Q	8010/8240
521-5*	Q	8010/8240	PZ-4	SA	8010/8240
* Extraction Wells					

Key: Q = Quarterly                      8010 = EPA Method 8010 or equivalent  
SA = Semi-Annually                  8020 = EPA Method 8020 or equivalent  
A = Annually                            8240 = EPA Method 8240 or equivalent  
8010/8240 = EPA Method 8240 in lieu of 8010 for fourth quarter


The dischargers shall sample any new monitoring or extraction wells quarterly and analyze groundwater samples for the same constituents as shown in the above table. The dischargers may propose changes in the above table; any proposed changes are subject to Executive Officer approval.

3. **Quarterly Monitoring Reports:** The discharger shall submit quarterly monitoring reports to the Board no later than 30 days following the end of the quarter (e.g. report for first quarter of the year due April 30). The first quarterly monitoring report shall be due on April 30, 1997. The reports shall include:
  - a. **Transmittal Letter:** The transmittal letter shall discuss any violations during the reporting period and actions taken or planned to correct the problem. The letter shall be signed by the dischargers' principal executive officer or their duly authorized representative, and shall include a statement by the official, under penalty of perjury, that the report is true and correct to the best of the official's knowledge.
  - b. **Groundwater Elevations:** Groundwater elevation data shall be presented in tabular form, and a groundwater elevation map should be prepared for each monitored water-bearing zone. Historical groundwater elevations shall be included in the fourth quarterly report each year.
  - c. **Groundwater Analyses:** Groundwater sampling data shall be presented in tabular form, and an isoconcentration map should be prepared for one or more key contaminants for each monitored water-bearing zone, as appropriate. The report shall indicate the analytical method used, detection limits obtained for each reported constituent, and a summary of QA/QC data. Historical groundwater sampling results shall be included in the fourth quarterly report each year. The report shall describe any significant increases in contaminant concentrations since the last report, and any measures proposed to address the increases. Supporting data, such as lab data sheets, need not be included (however, see record keeping - below).
  - d. **Groundwater Extraction:** If applicable, the report shall include groundwater extraction results in tabular form, for each extraction well and for the site as a whole, expressed in gallons per minute and total groundwater volume for the quarter. The report shall also include contaminant removal results, from groundwater extraction wells and from other remediation systems (e.g. soil vapor extraction), expressed in units of chemical mass per day and mass for the quarter. Historical mass removal results shall be included in the fourth quarterly report each year.
  - e. **Status Report:** The quarterly report shall describe relevant work completed during the reporting period (e.g. site investigation, interim remedial measures)

and work planned for the following quarter.

4. **Violation Reports:** If the dischargers violate requirements in the Site Cleanup Requirements, then the dischargers shall notify the Board office by telephone as soon as practicable once the dischargers have knowledge of the violation. Board staff may, depending on violation severity, require the dischargers to submit a separate technical report on the violation within five working days of telephone notification.
5. **Other Reports:** The dischargers shall notify the Board in writing prior to any site activities, such as construction or underground tank removal, which have the potential to cause further migration of contaminants or which would provide new opportunities for site investigation.
6. **Record Keeping:** The dischargers or their agent shall retain data generated for the above reports, including lab results and QA/QC data, for a minimum of six years after origination and shall make them available to the Board upon request.
7. **SMP Revisions:** Revisions to the Self-Monitoring Program may be ordered by the Executive Officer, either on his/her own initiative or at the request of the dischargers. Prior to making SMP revisions, the Executive Officer will consider the burden, including costs, of associated self-monitoring reports relative to the benefits to be obtained from these reports.

I, Loretta K. Barsamian, Executive Officer, hereby certify that this Self-Monitoring Program was adopted by the Board on January 15, 1997.

  
Loretta K. Barsamian  
Executive Officer